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State of California
AIR RESOURCES BOARD

Notice of Public Availability of Modified Text

PUBLIC HEARING TO CONSIDER ADOPTION OF THE VERIFICATION PROCEDURES, WARRANTY, AND IN-USE COMPLIANCE REQUIREMENTS FOR IN-USE STRATEGIES TO CONTROL EMISSIONS FROM DIESEL ENGINES

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At its May 16, 2002, public hearing, the Air Resources Board (the "Board" or "ARB") approved the adoption of sections 2700 through 2710, Title 13, California Code of Regulations (CCR), which provide the verification procedures, warranty, and in-use compliance requirements (the "Procedure") for diesel emission control strategies in California. The proposed regulations support the Diesel Risk Reduction Plan (DRRP), which was adopted by the Board on September 30, 2000. The DRRP outlines several measures with the goal of reducing in-use emissions of diesel particulate matter (PM). Forthcoming regulations, which are based on those measures, will rely upon a variety of diesel emission control strategies to achieve PM reductions. Verification of a retrofit-based diesel emission control strategy using the Procedure serves to ensure that the strategy will be able to achieve real and durable reductions. The Procedure is described in detail in the Initial Statement of Reasons (Staff Report), released on March 29, 2002.

The Board's Action

At the hearing, the Board adopted Resolution 02-23 (A copy of the adopted resolution is attached hereto as Attachment 1) approving the proposed regulations with modifications. Within the resolution, the Board directed the Executive Officer to adopt the proposed regulations after making available for public comment all changes specifically directed by the Board and any other necessary changes to the regulatory language as originally proposed in the Staff Report released on March 29, 2002. At the Board's direction, staff worked with members of the engine and emission control industries. The proposed substantive modifications are summarized below, and are set forth in detail in Attachment 2. For a copy of Attachment 2, please see "Availability of Modified Text."

Summary of Proposed Modifications

Title 13, California Code of Regulations
Section 2700. Applicability

Staff clarified that these procedures apply to in-use strategies which control emissions through the use of sound principles of science and engineering. The verification procedure is not intended to evaluate emission control strategies that rely on fundamental processes that are not yet based on scientifically thorough knowledge and experience. Such strategies cannot be properly evaluated by staff and must be left to the arena of research.

Section 2701. Definitions

(a)(2): Staff clarified the definition of "alternative diesel fuel" to include diesel fuel pre-mixed with a fuel additive. Specifically, a diesel emission control strategy using a fuel additive is to be treated as an alternative-diesel-fuel-based strategy unless: (1) the fuel additive is supplied to the vehicle or engine fuel by an on-board dosing mechanism, or (2) the fuel additive is directly mixed into the base fuel inside the fuel tank of the vehicle or engine, or (3) the additive and base fuel are not mixed until vehicle or engine fueling commences, and no more additive is mixed with the base diesel fuel than is required for a single fueling of a single engine or vehicle. This clarification removes the previous ambiguity concerning how fuel additives are distinguished from alternative diesel fuels.

(a)(6): Recognizing that not all diesel emission control strategies include or require the use of backpressure monitors (e.g. alternative diesel fuels), as the original language may have suggested, staff clarified the definition of "backpressure monitor." Backpressure monitors are used only with some hardware-based diesel emission control strategies that have a component installed in the exhaust system of a diesel engine.

(a)(9): Staff deleted the definition of "defeat device." "Auxiliary Emission Control Device" (AECD), defined in subsection (a)(4), is the more appropriate term and is sufficient for the purposes of this Procedure.

(a)(17): The original definition for "fuel additive" included substances that are added to fuel or fuel systems only. Staff has since learned, however, of additives that are added via the intake air. They are designed to alter the chemistry of combustion, as are their fuel-borne counterparts, and thus merit the same consideration and treatment under the Procedure. Staff therefore extended the definition of "fuel additive" to include substances added to engine-related systems such that they are present in-cylinder during combustion.

Consistent with the change to section 2701(a)(2), staff added a reminder that fuel additives used in conjunction with diesel fuel may be treated as an alternative diesel fuel.

(a)(19): Staff deleted the definition of "fuel borne catalyst" because the term is not used in the Procedure. Fuel borne catalysts are a subset of fuel additives, which are defined and referred to in the Procedure.

(a)(20): For consistency with the change to subsection (a)(19), staff replaced the reference to "fuel borne catalysts" with "fuel additives."

(a)(24): Staff added the definition of "verification" to clarify the meaning of the word as used in the Procedure. Verification is a determination by the Executive Officer that a diesel emission control strategy meets the requirements of the Procedure. Such a determination is based on data submitted or otherwise known to the Executive Officer and engineering judgement.

Section 2702. Application Process

(a): Staff clarified the language that the in-use compliance testing of the diesel emission control strategy is required after a specified number of units are sold or leased.

(b): To further clarify one of the functions served by the proposed verification testing protocol, staff added language indicating that the Executive Officer will use information submitted with the protocol to assist in determining if any additional analyses beyond the basic requirements are necessary, and if it is appropriate to allow alternatives to the prescribed requirements.

(b)(2): The original language in this section required a description of the operating principles of the diesel emission control strategy and/or a schematic depicting operation. As such, it erroneously suggested that an applicant may choose to submit a schematic alone with no description of the operating principles. Staff corrected the language to specifically require the applicant to submit a description and indicate that a schematic should be included as appropriate.

(d): This section originally required the applicant to follow the application format and to indicate which sections called for information that was not applicable to the applicant's system. Staff added the clarification that information deemed non-applicable by the applicant need not be submitted on the condition that the Executive Officer concurs with the applicant's judgement.

(d)(2.1.2): Staff added the words "as appropriate" to the schematics requirement for consistency with the change to subsection (b)(2), described above.

(d)(2.): Staff made the words "threshold" and "reduction" plural to clarify that (1) backpressure monitors may have more than one significant threshold which performs some function, and (2) there may be more than one form of reduction in the performance of a strategy that arises from unfavorable operating conditions.

(d)(2.2.7): Staff deleted the word "all" from the requirement to provide "complete discussion of all potential safety issues." This clarification more accurately represents staff's intent that applicants must discuss potential safety issues, but not undertake the unrealistic task of analyzing each and every imaginable scenario for safety issues that could potentially exist.

(d)(5.1.3): To both avoid the introduction of new terminology and to be consistent with that used in section 2703, staff replaced the word "de-greening" with "pre-conditioning."

(d)(7.A.1): For clarification, staff changed "Raw test data" to "Actual laboratory test data." This modification more clearly communicates that staff needs to review the actual laboratory reports issued to the applicant, and not just a table made by the applicant which summarizes test results.

(d)(7.D): To avoid redundancy and inconsistency, staff deleted the owner's manual requirements from the application format and added a reference indicating that these requirements are described in section 2706(i).

(f): Staff removed the upper bounds for the Level 1 and 2 verification classifications, thus defining the levels only by the minimum PM reduction achieved. This modification gives the Procedure more flexibility and accuracy in classifying strategies that have reductions which may vary from one level to another (under the previous definition) depending on the exact nature of the application. The use of upper limits to define Levels 1 and 2 miscommunicated staff's intent by suggesting that a diesel emission control strategy had to fit into narrow emission reduction windows for it to be verified. Removing the upper limits more accurately represents staff's priorities, which are that the prescribed minimum reductions be met and that overestimation of reductions is avoided.

Section 2703. Emission Testing Requirements

(c): To clarify that neither engine nor chassis testing is being singled out or required, staff added the words "or vehicle" to the language "The engine or vehicle installed with a diesel emission control system."

(e): Staff updated Table 2 to be consistent with the changes to section 2703(e)(1)(B), described below.

(e)(1)(B)(i): Staff deleted the cold-start Urban Dynamometer Driving Schedule (UDDS) test requirement. It was pointed out at the public hearing that running a cold-start UDDS cycle with a truck was not only unrepresentative given typical warm-up practices, but also problematic because heavy-duty trucks have air brakes which may not have adequate time during a cold-start test to build the air pressure required for normal operation.

(e)(1)(B)(ii): Staff modified the low-speed chassis test cycle requirements to allow the applicant to request that the Executive Officer waive the low-speed chassis test cycle

requirement. In considering the request, the Executive Officer may consider all relevant information such as the nature of the emission control group selected for verification and the operating principles of the applicant's system. This modification lessens the financial burden on those applicants for whom testing with the low-speed cycle would not provide meaningful information.

(e)(1)(B)(iii): In its original form, the Procedure provided no guidance concerning how closely a driver had to follow a given chassis test cycle. To address this, staff added tolerances for chassis test cycles, which were taken from the Code of Federal Regulations, Title 40, section 86.1215-85(b).

(e)(1)(C): Staff modified the test requirements for strategies intended to reduce NOx from on-road applications. First, staff added a requirement to discuss the effects of elevated NOx emissions on the strategy. This information would assist staff in determining (1) the necessity of conducting the additional testing described in this section, and (2) the appropriate weighting factors for test results from the additional testing that would be used in calculating an overall emission reduction. Second, staff replaced the requirement to use an additional test cycle that triggers all defeat devices with the requirement to use one that simply gives rise to significant periods of elevated NOx emissions. Requiring that the cycle trigger *all* defeat devices mischaracterized staff's intent, which was to determine performance of a strategy under high-NOx emission conditions that are typical on the road, but not observed during standard test cycles. Such a determination does not require that all possible high-NOx conditions be covered in a test cycle. Also, because of the widely-acknowledged difficulty in identifying the operating parameters that give rise to those conditions, it is unrealistic to require a cycle that includes them all. Last, staff added a provision allowing the applicant to request that this additional testing be waived. The Executive Officer's determination regarding such a request is based on all relevant information, such as the nature of the strategy and the availability of an appropriate test cycle. Originally, the Procedure did not provide an opportunity for this additional testing to be waived. As such, it erroneously indicated that staff wanted testing to be required for all cases, even those in which there may be little to no meaningful information gained from such testing. To assist staff in identifying those exceptional cases, staff chose to give applicants an opportunity to make a case for waiving the additional testing. With this opportunity, applicants may also be able to significantly lessen the financial burden associated with testing.

(g): Instead of stating that exhaust temperature and backpressure must be recorded for "filter-based" strategies, staff clarified that the requirement applies to strategies that "include exhaust aftertreatment." This clarification removes the ambiguity surrounding what constitutes a "filter" and more broadly applies the requirement to strategies that include a component which reduces emissions via treating the exhaust in some manner. Staff's original understanding had been that only filter-based strategies could potentially create significant backpressure increases, and that their operation was especially sensitive to exhaust temperature. There is, however, ambiguity concerning the definition of a "filter" as well as a broad range of existing aftertreatment system designs

that may affect backpressure in various degrees. In addition, while proper functioning of passive filters is utterly dependent on adequate exhaust temperatures, the performance of all strategies that involve catalysis in general (i.e., most exhaust aftertreatment systems) is a function of exhaust temperature. Knowing the conditions under which a strategy achieves a given level of performance is important information for staff to have when evaluating a strategy. Staff therefore chose to more broadly apply this requirement to all systems that treat exhaust. For consistency, staff made the same change to sections 2704(d)(1), 2704(g), and 2705(c)(1).

(j): Originally, this section required applicants to report test results "for all completed emission tests." Staff clarified this language such that only results from "all valid emission tests used to support emission reduction claims" need to be reported. As such, applications will not be cluttered with results from prototype development or other testing that may not meet the test requirements of the Procedure.

(l): Staff deleted the word "exhaust" from the "Additional Exhaust Analyses" section. The Procedure is intended to evaluate a host of diesel emission control strategies of unspecified nature, ranging from chemically-active filters to alternative diesel fuels and fuel additives. Because of its breadth, the Procedure requires a provision to allow for a potentially broad spectrum of additional analyses should there be grounds to believe that there may be a negative side effect associated with the use of a strategy. By not specifying that such additional analyses be limited to engine exhaust alone, staff's modification provides language that aligns itself more accurately with the original intention underlying the section. The part of the Staff Report that discusses additional exhaust analyses accurately states that, "staff deems it essential that additional analyses be required as necessary."

(l)(3): Staff added a subsection to section 2703(l) which indicates that the Executive Officer will work with the applicant in determining appropriate test methods for any additional analyses that may be required. A number of stakeholders had expressed confusion as to which test methods must be used to measure each of the substances listed (for illustrative purposes only) in the previous subsection (l)(2). The added language resolves this confusion by explicitly indicating that test methods will be determined as needed. Furthermore, by not specifying the test methods up front, applicants gain the benefit of greater flexibility in how to conduct additional analyses.

(m): Staff replaced an incorrect reference to the Code of Federal Regulations with the correct one.

Section 2704. Durability Testing Requirements

(c)(4): A reference was made in this section to Table 6, which is not located in section 2704. For clarity, staff added a reference to the section where it actually appears.

(d): Staff deleted language that referred to "periodic" emission testing (an artifact of an older version of the Procedure). The Procedure only requires testing before and after the service accumulation. To clarify what is meant by the "service accumulation," staff

added the following language: "Service accumulation begins after the first emission test and concludes before the final emission test." For further clarification, staff indicated that no pre-conditioning time may be used towards the service accumulation requirement.

(d)(1): To afford applicants greater flexibility, staff modified the data-logging requirement during service accumulation for filter-based strategies. Instead of specifying a maximum sampling period, the applicant may propose a sampling scheme for approval by the Executive Officer. The added language lists some elements that may be included in sampling schemes. The intent behind imposing a maximum sampling period was to avoid sampling so infrequently as to render the logged data meaningless. However, whether a given sampling frequency below the two minute cap will provide meaningful data or not depends on the specifics of the application (compare a stop-and-go solid waste collection vehicle and a steady-state electric power generator set, for instance). Thus, the Executive Officer must be able to review the proposed sampling scheme to ensure that meaningful data are obtained. The added language also removes the implicit suggestion that data must be logged on a strictly periodic basis. As such, it gives consideration for efficient schemes that average parameters, log only significant changes in a parameter, minimum and maximum values, etc. Doing so, the amount of data that must be gathered and handled by the applicant and reviewed by staff can be minimized.

(f)(1): Staff updated the testing requirements for on-road applications to make them consistent with the changes to sections 2704(d) and 2703(e)(1)(B)(i) and (ii).

(g): Staff updated the test run section to be consistent with the changes to sections 2704(d) and 2703(e)(1)(B)(i) and (ii).

(i)(2): For clarity, staff specified that the 0.01 g/bhp-hr emission level refers to PM. Also, staff deleted a redundant reference to "emission level."

(i)(4): In addition to not causing damage to the engine, as stated in the original language, staff added the clarification that the diesel emission control strategy must neither cause damage to the vehicle nor to the equipment on which it is installed.

Section 2705. Field Demonstration Requirements.

(c): Staff updated the data-logging requirements for filter-based strategies to make them consistent with the changes to section 2704(d)(1).

Section 2706. Other Requirements.

(a)(1): In the original language, the NO_2 emissions limit would take effect immediately. Most diesel particulate filters (DPFs) today, however, cannot meet this limit. Staff nevertheless recognizes the significant emissions reductions that today's DPFs provide and the substantial investments made by manufacturers in those designs. Thus, after discussion with manufacturers, staff proposed at the public hearing that the NO_2 limit take effect starting on January 1, 2004. After January 1, 2004, all verified and installed

systems must meet the NO_2 limit. That proposal, adopted by the Board at the hearing, allows limited penetration of current designs into the market and gives manufacturers time to re-design systems to be compliant with the limit in the near future. That will allow for near-term reductions of PM and other toxic emissions at the street and neighborhood level, immediately reducing exposure to those most directly impacted by diesel emissions. The potential increases in ozone and other regional-scale pollutants will not be measurable unless an extremely large number of are retrofitted with DPFs that do not meet the NO_2 limit. Under the schedule proposed in the Diesel Risk Reduction Plan, widespread application of DPFs will not occur for several years, by which time the NO_2 limit will be in effect.

(a)(2): Originally, the Procedure indicated that two chemiluminescence analyzers must be used to measure NO_2. Stakeholders had requested a method for measuring NO_2 during a workshop, and therefore staff included one in the Procedure. However, it was not intended by staff that the method be exclusive. For clarification of intent, staff added language which indicates that a dual-path chemiluminescence analyzer or other methods may be used, subject to approval by the Executive Officer.

(a)(3): Staff updated the description of the method for measuring NO_2 to be consistent with the changes to section 2706(a)(2). Also, staff added language to clarify that the instrument used for NO and NOx measurement must be calibrated in accordance with the appropriate Code of Federal Regulations procedure.

(a)(4): Consistent with the changes to section 2706(a)(2), staff added a section concerning alternative methods for measuring NO_2. In reviewing an applicant's request to use an alternative method, the Executive Officer may consider all relevant information.

(b)(1): Staff placed language describing the limits on emissions of non-methane hydrocarbons (NMHC) and NOx into a subsection of its own. Originally, the Procedure limited increases in these and other pollutants to no more than ten percent above the baseline level. Stakeholders pointed out, however, that this limit would prevent a number of viable, proven strategies that achieve significant PM and NOx reductions (such as conversion to bi-fuel natural gas/diesel operation) from being verified because they increase the low baseline emission level of NMHC intrinsic to diesel engines by more than ten percent. To allow short-term implementation of effective emission control strategies facing that issue, staff proposed at the public hearing that for a strategy verified prior to July 1, 2006, a decrease of NOx be permitted to offset the increase of NMHC provided the final sum of the two is lower than the baseline sum. After July 1, 2006, a strategy that exceeds the ten-percent limit may be verified provided the applicant submits atmospheric modeling data demonstrating that widespread use of its strategy will not adversely impact the public's exposure to ozone. The Board approved staff's proposal.

(b)(2): Staff placed language describing the limits on emissions of carbon monoxide (CO) into a subsection of its own. At the Board's direction, staff modified the limit for

CO: a strategy must not increase emissions beyond the current CO emission standard adopted by ARB for new diesel engines. This replaces the previous ten percent cap which, as mentioned above, would exclude some promising strategies from the verification process. Since CO emissions from diesel engines are typically low, this revision will not adversely affect California's CO attainment status.

(b)(3): A stakeholder at the public hearing voiced the concern that the restriction of increases in emissions of pollutants to ten percent above the baseline would prevent selective catalytic reduction (SCR) systems from being verified. Baseline emissions of ammonia from diesel engines are essentially zero, but a small amount of ammonia often goes unused in SCR systems and ends up in the exhaust, thereby creating an increase in excess of ten percent. At the Board's direction, staff addressed this concern with the addition of a separate subsection for the limit on emissions of ammonia.

It should be noted that the primary focus of the Procedure is to verify PM reductions, and that the prevalent technologies for PM reduction do not increase ammonia emissions. However, it is desirable, where possible to achieve NOx reductions in addition to PM reductions. Therefore, it is most appropriate to set an ammonia level that both keeps emissions at a safe level and allows for a relatively wide spectrum of potential NOx reductions.

After reviewing exposure limits for ammonia established by occupational health agencies and published data on the performance of modern SCR systems over transient test cycles, staff determined that the appropriate limit for ammonia emissions should be expressed in terms of the average concentration in the exhaust, rather than as a percentage of baseline emissions. The appropriate allowable level was determined to be 25 parts per million by volume (ppmv). For comparison, the Recommended Exposure Limit (REL) for ammonia set by the National Institute for Occupational Safety and Health (NIOSH) is 25 ppmv as a time weighted average. The REL set by the Occupational Safety and Health Administration (OSHA) is 50 ppmv. In addition, the Agency for Toxic Substances and Disease Registry (ATSDR) cites two values, 25 and 48 ppm, for the odor threshold of ammonia in air[1].

Staff opted for the lower bound of 25 ppmv to insure minimal exposure while still enabling significant NOx reductions through use of SCR. Data published in 2002 on the performance of modern SCR systems for mobile applications show that a number of systems are capable of achieving large NOx reductions (72-82 percent) on transient test cycles with average ammonia emissions of less than 10 ppmv [2,3,4]. One such system[3]

[1] ATSDR, 2002. Draft Toxicological Profile for Ammonia, September 2002, U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry.
[2] Gekas, I., et al., 2002. "Performance of a Urea SCR System Combined With a PM and Fuel-Optimized, Heavy-Duty Diesel Engine Able to Achieve the Euro V Emission Limits," Society of Automotive Engineers, SAE Technical Paper Series, Paper Number 2002-01-2885.
[3] Helden, R. van, et al., 2002. "Engine Dynamometer and Vehicle Performance of a Urea SCR-System for Heavy-Duty Truck Engines," Society of Automotive Engineers, SAE Technical Paper Series, Paper Number 2002-01-0286.

was demonstrated to maintain those levels of performance after having accumulated six months of field use. Staff's selection of 25 ppmv provides a cushion to allow for variation in ammonia emissions from one test cycle to another, as well as the use of alternate urea/ammonia injection strategies that may achieve NOx reductions in excess of 80 percent. In addition, because the limit selected by staff refers to the concentration of ammonia in the exhaust, safety is further insured owing to dilution of the exhaust upon exiting the tailpipe.

(b)(4): Staff retained the original language that limits increases in emissions of other pollutants and placed it in its own subsection.

(c): Originally, fuel additives had to be used in combination with a diesel particulate filter unless they could be proven safe for use alone. The original language did not, however, include an efficiency requirement for the diesel particulate filter, thus creating some ambiguity. The modified language resolves this ambiguity by requiring a Level 3 diesel particulate filter. As such, the requirement is in line with staff's original intent that fuel additives be used with a high-efficiency filter, and not simply any strategy bearing the name "diesel particulate filter."

(c)(4) & (c)(4)(A): The original language in this section required fuel additives that contain metals to undergo additional emission testing at an elevated concentration. This requirement was motivated by experience in which some metal-containing additives were found to clog a number of diesel particulate filters when high concentrations were used. The potential for use of a higher-than-intended additive concentration in the field, however, is certainly not limited only to those additives containing metals. User error, a faulty dosing mechanism, and other causes may result in operation of engines with an additive dosage that differs significantly from the concentration used during verification testing. Staff recognizes the importance of understanding the consequences of such operation, especially given that a broad, unspecified range of substances may be considered a fuel additive under this Procedure. For these reasons, staff changed the requirement for high-concentration testing to include all fuel additives.

(c)(4)(B): Two references to a fuel additive dosage of "50 ppm" incorrectly omitted the possibility that the dosage to be used, as specified in subsection (c)(4)(A), could be 10 times higher than that specified for normal use. Staff corrected those references by pointing to the more complete requirements of subsection (c)(4)(A).

(c)(5): Staff added language to remind applicants that fuel additives must be in compliance with applicable federal, state, and local government requirements. The added language helps to make the applicant aware that verification of a fuel additive under this Procedure does not mean that the product automatically satisfies all other governmental requirements.

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[4] Majewski, W.A., 2002. "Selective Catalytic Reduction," Ecopoint Inc., DieselNet Technology Guide, Revision 2002.05.

(d)(1): The Procedure gave accumulation of ash as an example of a way in which engine backpressure could gradually increase over time, but did not indicate where this accumulation took place. Staff added "in a filter" to the example to clarify the intended meaning.

(f): Staff clarified that the applicant is not required to submit cost information for any normal maintenance items that the applicant does not intend to provide free of charge. Some stakeholders had inferred that such cost information was required, but this was not staff's intent.

(g): Staff clarified that the applicant must ensure that a label is affixed to the diesel emission control system and the engine. Thus, the applicant is not itself required to affix the labels, but is responsible for seeing that they are affixed, for example, by the system installer. If the month and year of manufacture can be readily obtained from the applicant by reference to the serial number, that information is not required on the label. If the applicant would like to use an alternative label format or would rather not affix a label to both the system and the engine, the applicant may request to be relieved from these requirements. The Executive Officer may consider the request and make a determination based on all relevant information. Finally, staff made minor clarifications to the section that explain the meaning of the symbols in the diesel emission control strategy family name.

(i): For clarification and consistency with the owner's manual requirements in the application format in section 2702(d), staff added that the installation procedure (not just the installation requirements) and all fuel requirements (not just the fuel sulfur limit) must be included in the owner's manual.

(j): Recognizing that ARB does not regulate noise level, staff recast the noise level control subsection to serve as a reminder that all strategies must be in compliance with applicable government requirements. Staff also corrected the language to state that a strategy which replaces a muffler must provide at least the same noise attenuation as the muffler with which the vehicle was originally equipped by the "vehicle or engine manufacturer," not the applicant.

(k): At the public hearing, the Board adopted staff's proposal that all strategies which rely on fuel changes either through the use of additives or alternative diesel fuels must undergo an evaluation of the multimedia effects resulting from use of the strategy. To be part of a verified diesel emission control strategy, the California Environmental Policy Council must determine that use of the additive or fuel will not cause a significant adverse impact on the public health or the environment, consistent with section 43830.8 of the Health and Safety Code. This modification requires that the same level of investigation that is required for regulations which propose a specification for motor vehicle fuel be used when evaluating fuel-based strategies that are intended to satisfy ARB regulations for control of emissions from in-use diesel engines. Thus, significant safeguards to prevent the use of harmful substances are built into the verification process.

Section 2707. Warranty Requirements
(a): Staff divided this subsection into two separate subsections, one for the product warranty and the other for the added installation warranty. To improve readability, staff further organized the contents of the product warranty subsection into five subsections, 2707(a)(1)(A) through (E).

(a)(1)(A): For clarity, staff reworded the requirement that the applicant provide a warranty to the "ultimate purchaser and to each subsequent purchaser" to read "all owners, for ownership within the warranty period and lessees, for lease contract within the warranty period." Also, to reinforce that the first instance of the word "operation" in this subsection is not intended to mean operation of a vehicle or equipment, staff added "of the diesel emission control strategy." Finally, the original language did not address the potential situation in which a strategy is used in a manner inconsistent with the conditions of use listed in the Executive Order. Staff added language, therefore, to clarify that use in a consistent manner is a condition for warranty coverage.

(a)(1)(B): For consistency with other references in section 2707(a) that indicate warranty coverage includes "repair or replacement," staff added "repair" to this subsection, which only mentioned replacement in the original language.

(a)(1)(C): For clarification, staff added a limitation to coverage required for damage caused by the diesel emission control strategy such that coverage extends only to returning the damaged item(s) to the condition they were in prior to the failure. This clarification is intended to prevent an owner from exploiting the warranty by having a damaged item replaced with one of greater value, such as a brand new engine. Also, staff added a related limitation to coverage of diagnostic expenses such that coverage extends to "only those relevant diagnostic expenses in the case in which a warranty claim is valid." This clarification is intended to prevent applicants from being charged for diagnostic testing that is superfluous and in those cases in which their product was not responsible for the damages claimed. Finally, staff added a provision that gives the applicant the option of simply paying the fair market value of the damaged items prior to the time the failure occurred. This provision would lessen the financial burden on the applicants in those cases where the cost of returning damaged items to their previous condition exceeds the fair market value of those items.

(a)(1)(D): The original language stated that under certain conditions, the repair or replacement of a warranted part "shall" be excluded from warranty coverage. Use of the word "shall" implied that exclusion was required, which was not staff's intent. For clarification, staff replaced "shall" with "may" and added that exclusion was "at the applicant's discretion" if the appropriate conditions are met.

(a)(1)(E): Staff clarified the statement that failure to perform maintenance-related activities shall not, per se, be grounds for disallowing a warranty claim by specifying that such activities pertain to the vehicle or equipment, engine, and the diesel emission control strategy itself. There was ambiguity in the original language as to which items

the maintenance was referring to. Also, staff added language to clearly indicate that although failure to perform maintenance-related activities is not, per se, grounds for denying a claim, it nevertheless "may" be grounds for denying a claim. Use of such language does not change the meaning of the original statement, but rather makes explicit the possibility that not ensuring maintenance could potentially support denial of a claim.

(a)(2): Staff added language requiring the installer of a verified diesel emission control system to provide the same type of warranty coverage for the installation that the applicant provides for the product itself. If they are to operate properly, diesel emission control systems must be both in good working order and correctly installed. However, the manufacturers and installers may be distinct entities. The added language acknowledges these circumstances and resolves the ambiguity surrounding with whom the responsibility for the product and the installation lies. Note that because the language broadly states that "a person or company who installs" a system must bear the responsibility for the installation, an installation performed by the owner is the owner's responsibility.

(b): In parallel with the restructuring of section 2707(a), staff divided this subsection into two separate subsections, one for the product warranty statement and the other for the added installation warranty statement.

(b)(1): Staff made minor clarifications to the "YOUR WARRANTY RIGHTS AND OBLIGATIONS" statement which the applicant must include in the owner's manual. To further clarify the nature of the warranty coverage to the owner, staff inserted language from subsection (a)(1)(A) which describes the warranty. Staff corrected the reference to abuse, neglect, and improper maintenance to reference the diesel emission control system, not just the owner's vehicle or equipment. Staff also indicated that the various owner's manuals associated with the strategy and vehicle or equipment are a source for more information on what is meant by abuse, neglect, and improper maintenance. Regarding the coverage of damage to a vehicle or piece of equipment caused by a diesel emission control system, staff added the clause "where a warrantable condition exists" for clarification. To alert the owner that there may be other warranty information beyond that required by ARB, staff added the language, "Please review your owner's manual for other warranty information."

Staff made clarifications to the "APPLICANT'S WARRANTY COVERAGE" statement which the applicant must include in the owner's manual. Staff deleted subsection (1) because the warranty coverage section is not an appropriate place to include references to corrective action an applicant would take if it failed its in-use compliance test. That information is included in section 2709. For consistency, staff added language similar to that in section 2707(a)(1)(A) to subsection (2). Finally, staff added the language from section 2707(a)(1)(C), thus giving the owner further information on the coverage of damage caused by the diesel emission control system.

Staff made clarifications to the "OWNER'S WARRANTY RESPONSIBILITY" statement which the applicant must include in the owner's manual. The recommendation that the owner keep all receipts for maintenance performed on the diesel emission control strategy was expanded by staff to include maintenance records and receipts for the vehicle or equipment, because that maintenance may also have an impact on the functioning of the strategy. Staff made the statement concerning the owner's failure to keep receipts consistent with the changes to subsection (a)(1)(E). The original language gave a 30-day time limit for the applicant to perform a warranty repair or replacement. This limit does not adequately address situations in which replacements are not readily available and thus require more time (as may be the case with systems that are custom-made to meet the needs of unique applications). To lessen the burden on applicants under such circumstances, the replacement time limit was extended to 90 days in the event that a replacement is not available. Finally, to encourage the owner to submit warranty information requested by the applicant for the applicant's records, staff added language indicating that failure to do so within 30 days of installation may void the warranty.

(b)(2): For consistency with the product warranty statement and to better inform the owner, staff added language requiring the installer of a verified diesel emission control system to provide the owner with an installation warranty statement. The original language did not require the owner to be directly informed about the installation warranty.

(c): At the Board's suggestion, staff added the requirement that if warranty claims exceed four percent of the number of diesel engines using the strategy, an additional warranty report must be submitted within 30 calendar days of that time. This modification is intended to give ARB early notice if any verified strategies are experiencing significant problems in the field.

(c)(1): Staff clarified that the annual diesel emission control strategy warranty report should include the annual and cumulative sales as well as annual and cumulative leases of diesel emission control systems.

(c)(3): For clarification and consistency, staff added the qualification "California only" to the requirement for the annual summary of warranty claims.

Section 2708. Determination of Emissions Reduction

(a): For clarification, staff moved the sentence in subsection (a)(1)(A), regarding the situation in which the applicant only performs one of the two durability baseline tests, out of (a)(1)(A) and into subsection (a), as the applicability of that sentence extends beyond what its original location might suggest. Also, staff corrected the wording to be consistent with section 2704(g), which states that baseline testing is required for either the initial or final test, not both.

(a)(1): Staff deleted the reference to a cold-start UDDS test to be consistent with the changes to section 2703(e)(1)(B)(i).

(a)(1)(B): Staff added a section addressing the determination of NOx reductions from on-road applications. The test results from the additional testing for NOx reductions (described in section 2703(e)(1)(C)) must be weighted using weighting factors that are determined by the Executive Officer in consultation with the applicant. The original language provided no special guidance on how to account for the test results from this additional testing, and thus suggested that they be given the same weight as results from the standard required tests. The use of weighting factors would enable staff to more accurately estimate the NOx reductions that a given strategy would realize in the field, based on factors such as the amount of time that vehicles within the emission control group are expected to have elevated NOx emissions.

(b): For consistency with the changes to section 2702(f), staff deleted the upper bounds for Level 1 and Level 2.

Section 2709. In-Use Compliance Requirements

(a): Staff clarified that the in-use compliance testing is required after 50 units of diesel emission control strategy are sold or leased.

(d)(1): Staff clarified the reference to an emission level of 0.011 g/bhp-hr by indicating that it is an emission level for PM.

(h): Staff corrected the in-use compliance report language to be consistent with the language and intent in the Staff Report. The original language erroneously suggested that the applicant was required to submit an in-use compliance report after completing "both" phases of in-use compliance testing. Staff replaced "both" with "each," as in the Staff Report. To reinforce that a report must follow each phase of testing, staff modified the informational requirements such that they must be met for each of the minimum of four, not eight, systems tested.

(i): Staff increased the warranty claim threshold above which the Executive Officer may request the applicant to perform additional in-use testing from two to four percent. Staff concurred with stakeholders' comments that two percent was too low a threshold to trigger additional testing. As a reminder, staff added language stating that the applicant must submit a warranty report if warranty claims exceed four percent, consistent with the changes to section 2707(c).

Section 2710. Verification of Emission Reductions for Alternative Diesel Fuels

(a): To eliminate redundancy, staff deleted the definition for alternative diesel fuels from this section. The definition already appears in section 2701.

(b)(1): The original language required that the references to sampling and analyses in the proposed test protocol be consistent with the requirements of the Procedure. For clarification and specificity, staff changed the reference to the requirements of the Procedure to those in section 2703 (Emission Testing Requirements).

(b)(2)(D): In the original language, a toxic analysis of the diesel base fuel in emulsified diesel fuels was not necessary. Staff expanded this beyond emulsified diesel fuels to all alternative diesel fuels that are in part comprised of standard diesel fuel.

(b)(3)(A): For clarification, staff corrected the first reference fuel option to indicate a "10 percent aromatic California diesel reference fuel" as compared to the original language which described a "California produced 10% reference fuel."

(b)(3)(C): To clarify the meaning of "80:20 biodiesel fuel," staff parenthetically added "(80 percent diesel/20percent biodiesel)." As with the proposed clarification in (3)(A) above, staff changed "10 percent reference fuel" to "10 percent aromatic California diesel reference fuel." Also, staff modified the title of Table 6 to read "Fuel Test Methods and Reference Fuel Specifications" to be more consistent with the contents of the table.

(d)(1): In order to be consistent with the requirements in section 2703(j), staff added NO_2, carbon monoxide, and carbon dioxide to the list of species that must be measured.

(d)(2): In the original language, no guidance was provided on the required number of test samples for toxic emissions testing. Staff clarified that this testing must be performed with a minimum of three test samples collected from separate emission test repetitions, which is consistent with the three repetitions called for in section 2703 for hot-start test cycles.

(d)(3)(A): The original language in this section described the test sequences to be followed, but provided no guidance on the nature of the testing itself. Staff, therefore, added references to the relevant test requirements in section 2703 and indicated that the Federal Test Procedure (FTP) Heavy-duty Transient Cycle must be used. Also, staff added the alternative test sequence "RC RC RC RC RC" to subsection (i). This sequence had been mistakenly omitted in the original language.

(d)(3)(A)(iii): Subsection (d)(3)(A) originally offered no consideration for alternative test sequences beyond those listed in (d)(3)(A)(i) and (ii). Staff added section (iii) to clarify staff's intention that alternatives may be considered, and to be consistent with the similar consideration offered for alternative test cycles and methods in section 2703(f).

(e): The original language suggested that an applicant had to fulfill all of the durability requirements in section 2704. Thus, it appeared as though emission testing was required both before and after the service accumulation of 1,000 hours or 50,000 miles. For clarification, staff delineated the subsections of 2704 that the applicant must follow and excluded the emission testing and fuel requirements in those subsections. For consistency with the Procedure's treatment of hardware-based systems, staff added the condition that the emission testing requirements in section 2704 apply if the applicant's product includes hardware components. The original language was also unclear as to when test data should be gathered to show the effect of the alternative diesel fuel on the

test engine. Staff clarified that the data must be obtained after completion of the service accumulation.

(f): Consistent with section 2706(k), staff added a subsection describing multimedia assessment requirements for fuel-related strategies. The added language is identical to that described above for section 2706(k).

(g): To eliminate redundancy, staff deleted the statement that "the candidate fuel must be in compliance with applicable federal, state, and local government requirements." For clarification, staff specified that applicants must not only contact but register with the U.S. EPA and the California Department of Food and Agriculture.

(h): Staff added conditional verification requirements for alternative diesel fuels. If an alternative diesel fuel has completed all the requirements of the Procedure (including the multimedia assessment) except for completion of the U.S. EPA registration process, but has received some form of permission from U.S. EPA for the fuel to be used, then that fuel may be granted conditional verification. Conditional verification may be granted for off-road and stationary applications only after it is granted for on-road applications. Full verification is contingent on completion of the U.S. EPA registration process within one year after receiving conditional verification. During this one-year period, conditional verification is equivalent to verification for the purposes of satisfying the requirements of the in-use emission control regulations. The addition of conditional verification for alternative diesel fuels is an acknowledgement by staff that completion of the U.S. EPA registration process may require a considerable amount of time, and that if an applicant satisfactorily meets all of the other requirements of the Procedure, then the alternative diesel fuel should be acceptable for use in California to the extent of the permission granted by U.S. EPA.

(i): Staff added requirements for extending an existing verification to include other emission control groups. In addition to referencing the general guidelines in section 2702(g) for extension of a verification, staff clarified that the applicant may request a reduced number of emission tests relative to that performed for the original verification. This clarification is staff's response to concerns raised by stakeholders that the large number of test runs required for alternative diesel fuels would have to be repeated for each subsequent extension of verification to other emission control groups.

Availability of Modified Text

Attachment 1 (Board Resolution 02-23), Attachment 2 (text of the modified language), and Attachment 3 (list of additional documents relied upon) are available online at the ARB's internet site for the regulatory documents in this rulemaking:

http://www.arb.ca.gov/regact/dieselrv/dieselrv.htm

Attachment 2 contains the text of the regulations affected by the modifications being proposed with this notice. Additions to the originally proposed language are shown in underline, and deletions are shown in ~~strikeout~~. The ARB is also adding documents listed in Attachment 3 to the rulemaking record. Staff relied upon the documents in adopting these proposed regulations

Printed copies may be obtained by contacting Neidy Pinuelas, Heavy-Duty Diesel In-Use Strategies Branch secretary, at 626-350-6454 or npinuela@arb.ca.gov, or by faxing or mailing the request form attached to the end of the notice to the address or number detailed on the form.

Comments and Subsequent Action

In accordance with section 11346.8 of the Government Code, the Board directed the Executive Officer to adopt sections 2700 through 2710, Title 13, CCR, after making them available to the public for comment for a period of at least 15 days. The Board further provided that the Executive Officer shall consider such written comments as may be submitted during this period, shall make such modifications as may be appropriate in light of the comments received, and shall present the regulations to the Board for further consideration if warranted.

Written comments on the modifications must be submitted by postal mail, electronic mail, or facsimile as follows:

Postal mail must be sent to:

Clerk of the Board
Air Resources Board
1001 "I" Street, 23rd Floor
Sacramento, California 95812

Electronic mail must be sent to: dieselrv@listserv.arb.ca.gov

Facsimile submissions must be transmitted to the Clerk of the Board at:
(916) 322-3928.

In order to be considered by the Executive Officer, comments must be directed to the ARB in one of the three forms described above and received by the ARB by 5:00 p.m.

on February 13, 2003. Only comments relating to the modifications to the text of the regulations shall be considered by the Executive Officer.

If you have special accommodation or language needs, please contact Neidy Pinuelas, Heavy-Duty Diesel In-Use Strategies Branch secretary, at 626-350-6454 or npinuela@arb.ca.gov as soon as possible. TTY/TDD/Speech-to-Speech users may dial 7-1-1 for the California Relay Service.

Sincerely,

//s//

Robert H. Cross, Chief
Mobile Source Control Division

Attachments